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EXAMINER	
MERED, HABTE	
ART UNIT	**PAPER NUMBER**
2616	

DATE MAILED: 06/02/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/533,421	ROBERSON, CHARLES S.	
	Examiner	Art Unit	
	Habte Mered	2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 March 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-10 and 12-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-10 and 12-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. The amendment filed on 21 March 2006 has been entered and fully considered.

2. Claims 2 and 11 are cancelled. Claims 23 and 24 are new.

3. Claims 1, 3-10, and 12-24 are pending.

Drawings

4. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the backplane forming a plurality of data buses, the data buses, and the communication links between the plurality of elements claimed in claims 1, 10, 19, 20, and 21 are not shown in any of the figures and must be shown or the features canceled from the claims and no new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New

Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. **Claims 1, 10, 19, 20, and 21** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

7. In **claims 1, 10, 19, 20, and 21** the ability to monitor the operational status for each one of the communication links between the plurality of elements is claimed. The support provided for this limitation is simply a re-statement of the claimed limitation as indicated in the Specification on Page 11, in Lines 25-32 and Page 17 in Lines 30-32. The support provided in the Specification on Page 18, Lines 10-15 is very specific to detecting the status of a card. The support provided does not enable one skilled in the art to make or use the invention because it is not clear at all how the Equipment Link State Manager (ELSM) 820 shown in Figure 8 monitors and maintains information about each communication link. Simply put, how and using what mechanism is the Equipment Link State Manager 820 able to obtain communication link status information in general

and status information of communication links between cards in particular? It is not clear how the failure condition of the cards alone or the links alone can be determined independently given the fact that the cards are connected to the links.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. **Claims 1, 3, 6, 10, 12, 15, and 20-24,** as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Cantwell et al (US 6, 370, 155), hereinafter referred to as Cantwell, in view of Barker et al (US 6, 363, 421), hereinafter referred to as Barker.

10. Regarding **claims 1, 10, 20, and 21**, Cantwell discloses a method for controlling the operation of a flexible cross-connect system **(Figure 1)** which has a plurality of elements including an active control unit **(Figure 1, element 12, Column 3, Lines 26 and 40-45)**, a redundant control unit **(Figure 1, elements 12 A & B; Column 3, Lines 37-40)**, a plurality of interface cards **(Figure 1, elements 28 and 30; Column 6, Lines 5-10)**, an active cross-connect unit, a redundant cross-connect unit **(Figure 1, elements 24 and 26; Column 4, Lines 1-10)**, and a backplane forming a plurality of data buses **(Column 13, Lines 63-67; Column 16, Lines 33-38 and Column 18, Lines 40-45. In Figure 5 the Network Interface card is shown connected to the backplane as further illustrated in Column 13, Lines 63-67)**, the data buses acting as

communications links between the plurality of elements **(See Column 10, Lines 42-45 with respect to Figure 4 and Column 11, Lines 5-10 with respect to Figure 3 and Column 15, Lines 35-37)**, that comprises:

monitoring the operational status for each one of the plurality of elements and each one of the communications links between the plurality of elements within the flexible cross-connect system; **(Cantwell teaches monitoring the operational status of the cards in terms of detecting fuse failures and fuse panel power failures as well as monitoring the operational status of links by monitoring analog and digital signal loss as illustrated in Column 15, Lines 30-35 and 55-60. Communication link monitoring is also provided as part of DS1 path and line performance monitoring. Column 12, Lines 41, 47, and 55; Column 13, Lines 7, Line 12, and 19; Column 15, Line 58; Column 17, Lines 45-48;)**

determining when the operational status of any of the plurality of elements or the communications links between the plurality of elements indicates that the element or the communications link between the plurality of elements is non-operational; **(Column 12, Lines 41, 47 , and 55; Column 13, Lines 7, Line 12, and 19; Column 15, Line 58; Column 17, Lines 45-48; Column 7, Lines 38-42; Performance monitoring of network elements involves data collection as well as determining the operational status of network elements by comparing the observed test results to predetermined threshold values)**

autonomously switching from the non-operational active element to an associated redundant element when the operational status of the non-operational active element is

determined or from the non-operational active communications link between the plurality of elements to an associated redundant communications link between the plurality of elements when the operational status of the non-operational active communications link between the plurality of elements is determined; **(Column 16, Lines 41-46;Column 17, Lines 45-48; Column 18, Lines 50-55. Cantwell's system allows autonomous switching at the network interface card level and at the system communication link level if the non-operational active card's or active link's performance monitoring indicated the need to switch to the redundant card or link respectively. Further Cantwell discloses autonomous switching can be made at the Administrative Subsystem level as well as at the network interface card level as illustrated in Column 7, Lines 60-67; Column 8, Lines 1-3; Column 17, Lines 40-48; and Column 19, Lines 32-42)**

determining when the non-operational active element or the non-operational active communications link between the plurality of elements requires maintenance; **(In Column 2, Lines 42-49; Column 6, Line 25-28; and Column 9, Lines 35-42, Cantwell teaches maintenance is done on a primary network interface card (i.e. an active element). An absolute necessary condition for maintenance to occur is the detection of failure condition. Cantwell defines error condition as LOS, LOF, etc... in Column 13, Lines 57-59. Further Cantwell teaches detection of failure condition in column 15, lines 55-60.)**.

Cantwell, however, does not expressly disclose reporting maintenance is required for non-operational elements.

Barker discloses a system and a method to remotely manage any network element.

Barker discloses a system that reports maintenance is required for the non-operational active element or the non-operational active communications links between the plurality of elements when it is determined that the non-operational active element or the non-operational active communications link between the plurality of elements requires maintenance. **(Barker uses SNMP protocol to monitor and get status from the network entities it monitors. See Column 4, Lines 43-48 and 56-62. Barker further indicates that different messages are reported to the Element Management System including operational state change (Column 34, Item1), Alarms (Column 34, Item 2), Information Message (Column 34, Item 3), and Configuration Change (Column 34, Item 4). See also Column 1, Lines 49-54. Further, Barker teaches that alarms indicate a condition of unexpected nature, which requires special and persistent technician notification that is tantamount to indicating maintenance is required to one skilled in the art.)**

It would have been obvious to a person of ordinary skill in the art at the time of the invention to use the maintenance-reporting scheme of Barker in Cantwell's invention when a card or a link fails. One would have been motivated to do this because having ability to remotely manage a network element such as a digital cross-connect is essential in a large telecommunication network as stated by Barker in Column 1, Line 20 and will reduce operation and labor cost by remotely managing the cross-connect nodes in the network.

11. Regarding **claims 3 and 12**, Cantwell disclosed the aforementioned invention, including the method of preventing communications from being sent to the non-operational active element or over the non-operational active communication link. **(In telecommunication switching circuitry any card or link made out of service (OOS) and unavailable is unable to communicate with other network elements and is a status used to indicate "an entity is unavailable" to conduct normal operations. In Cantwell's system the status OOS is used for both cards and links. See Column 7, Lines 38-42.)**

12. Regarding **claims 6 and 15**, Cantwell discloses a method for controlling the operation of a flexible cross-connect system **(Figure 1)** which has a plurality of elements including an active control unit **(Figure 1, element 12, Column 3, Lines 26 and 40-45)**, a redundant control unit **(Figure 1, elements 12 A & B; Column 3, Lines 37-40)**, a plurality of interface cards **(Figure 1, elements 28 and 30; Column 6, Lines 5-10)**, an active cross-connect unit, a redundant cross-connect unit **(Figure 1, elements 24 and 26; Column 4, Lines 1-10)**, and a backplane forming a plurality of data buses **(Column 13, Lines 63-67; Column 16, Lines 33-38 and Column 18, Lines 40-45. In Figure 5 the Network Interface card is shown connected to the backplane as further illustrated in Column 13, Lines 63-67)**, the data buses acting as communications links between the plurality of elements **(See Column 10, Lines 42-45 with respect to Figure 4 and Column 11, Lines 5-10 with respect to Figure 3)**, that comprises:

monitoring the operational status for each one of the plurality of elements and each one of the communications links between the plurality of elements within the flexible cross-connect system; **(Cantwell teaches monitoring the operational status of the cards in terms of detecting fuse failures and fuse panel power failures as well as monitoring the operational status of links by monitoring analog and digital signal loss as illustrated in Column 15, Lines 30-35 and 55-60. Communication link monitoring is also provided as part of DS1 path and line performance monitoring. Column 12, Lines 41, 47, and 55; Column 13, Lines 7, Line 12, and 19; Column 15, Line 58; Column 17, Lines 45-48;)**

determining when the operational status of any of the plurality of elements or the communications links between the plurality of elements indicates that the element or the communications link between the plurality of elements is non-operational; **(Column 12, Lines 41, 47 , and 55; Column 13, Lines 7, Line 12, and 19; Column 15, Line 58; Column 17, Lines 45-48; Performance monitoring of network elements involves data collection as well as determining the operational status of network elements by comparing the observed test results to predetermined threshold values)**

autonomously switching from the non-operational active element to an associated redundant element when the operational status of the non-operational active element is determined or from the non-operational active communications link between the plurality of elements to an associated redundant communications link between the plurality of elements when the operational status of the non-operational active communications link between the plurality of elements is determined; **(Column 16, Lines 41-46;Column 17,**

Lines 45-48; Column 18, Lines 50-55. Cantwell's system allows autonomous switching at the network interface level and at the system communication link level if the non-operational active card's or active link's performance monitoring indicated the need to switch to the redundant card or link respectively. This is further illustrated in Column 7, Lines 60-67; Column 8, Lines 1-3; Column 17, Lines 40-48; and Column 19, Lines 32-42)

Cantwell, however, does not expressly disclose a method that includes detecting and reporting when any element or communications link between the plurality of elements change in operational status.

Barker discloses a method of detecting and reporting when any element or communications link between the plurality of elements has a change in operational status. **(Barker indicates that operational status change of any network element remotely managed and monitored by his system is detected through the use of trapping and polling. See Column 4, Lines 43-47 and 53-62 and Column 13, Lines 55-60 and Column 15, Lines 15-20 and Column 17, Lines 5-10, and Column 25, Lines 40-65 and 65-67 and Column 24, Lines 1-4 and Column 28, Lines 20-35 and also Column 1, Lines 45-55)**

It would have been obvious to a person of ordinary skill in the art at the time of the invention to use the maintenance-reporting scheme of Barker in Cantwell's invention when a card or a link fails. One would have been motivated to do this because having the failed component up and running again would ensure that the current connection has a backup connection for when it breaks down in the future guaranteeing continued

path protection and end-to-end path integrity. Further including Barker's method and system in Cantwell's system eases remote network management and cuts down on operation and labor cost.

13. Regarding **claim 22**, Cantwell discloses a method wherein the communication links between the plurality of elements include at least a first communications link between the plurality of interface cards **(See in Figure 2 how network 28 and network 30 are linked via a communication link as further illustrated in Column 8, Lines 3-10.)** and at least a second communications link between at least one interface card of the plurality of interface cards and one at least one of the active cross-connect unit, the redundant cross-connect unit, the active cross-connect unit, or the redundant control unit **(See in Figure 2, network interface cards 28 and 30 in direct communication with both the active cross-connect (matrix-a) and the redundant cross-connect (matrix-b) via a communication link as further illustrated in Column 8, Lines 39-50)**.

14. Regarding **claim 23**, Cantwell discloses a method wherein autonomously switching from the non-operational active element to the associated redundant element includes switching from the active control unit to the redundant control unit. **(In Cantwell's system the control unit is the Administrative Subsystem and has an active and a redundant units $ADMN_A$ and $ADMIN_B$ as shown in Figure 1, element 12. In Column 3, Line 37-40 Cantwell shows that the Administrative subsystem has the highest level of control in the system. Given that the Administrative subsystem has the highest level of control and redundancy, autonomously**

switching from active to redundant is inherent when the active Administrative Subsystem fails.)

15. Regarding **claim 24**, Cantwell discloses a method wherein autonomously switching from the non-operational active card to the associated redundant card includes switching from the active cross-connect unit to the redundant cross-connect unit. **(Column 7: Lines 35-42 and Column16: Lines 41-46)**

16. **Claims 7, 8, 16 and 17** are rejected under 35 U.S.C. 103(a) as being unpatentable over Cantwell et al (US 6,370,155), hereinafter Cantwell, in view of Barker et al (US 6, 363, 421), hereinafter referred to as Barker, as applied to claims 6 and 15, above, and further in view of Fowler (Henry Fowler, "TMN-Based Broadband ATM Network", IEEE Communication Magazine, March 1995).

17. Regarding **claims 7 and 16**, the combination of Cantwell and Barker teaches all aspects of the claimed invention as set forth in the rejections of claims 6 and 15 respectively but does not expressly disclose reporting the change in operational status after a predetermined period of time has expired.

Fowler discloses the Telecommunication Management Network (TMN) interfaces being defined for remote Management Systems to communicate with ATM network elements (NEs) and other management systems.

Fowler discloses an ATM network element issuing a failure notice and reporting it to its remote Management System after an alarm indication persists for a period of time. **(See Page 78, 2nd Column, 3rd paragraph under "ATM Layer Management" section)**

18. Regarding **claims 8 and 17**, the combination of Cantwell and Barker teaches all aspects of the claimed invention as set forth in the rejections of claims 6 and 15 respectively but does not expressly disclose discarding the change in operational status when the change in operational status does not persist for the predetermined amount of time.

Fowler discloses discarding the change in operational status when the change in operational status does not persist for the predetermined amount of time. **(See Page 78, 2nd Column, 3rd paragraph under "ATM Layer Management" section If the system never meets the time period required for issuing failure notices, then the system will not send any failure notice or change of operational status. Inherently then, the change of operational status has to be discarded.)**

19. With respect to **claims 7, 8, 16 and 17**, it would have been obvious to a person of ordinary skill in the art to wait an amount of time as taught by Fowler before issuing the operational change in status of the system disclosed by Cantwell. One would have been motivated to do this to minimize maintenance cost that can arise from transient failures.

20. **Claims 4 and 13** are rejected under 35 U.S.C. 103(a) as being unpatentable over Cantwell et al (US 6,370,155), hereinafter Cantwell, in view of Barker et al (US 6, 363, 421), hereinafter referred to as Barker, as applied to claims 3 and 12, above, and further in view of Jun et al (Jun et al, "Stand-by Loading Scheme: An Effective Software Retrofit Method For Switching System", IEEE, Presented at Computer Communications 1998 Proceedings, 06/30/98), hereinafter referred to as Jun.

The combination of Cantwell and Barker teaches all aspects of the claimed invention as set forth in the rejections of claims 3 and 12 but does not disclose that a card is flagged with a non-operational status if the card is receiving a software upgrade.

Jun discloses an effective software retrofit method for a switching system.

Jun discloses that a card is identified with a non-operational status if the card is receiving a software upgrade. **(See Figure 4 and Section 4.1)**

It would have been obvious to a person of ordinary skill in the art at the time of the invention to have the redundant parts in the combination of Cantwell's and Barker's invention operate the same way as described in Jun's system during software upgrade. One would have been motivated to do this because the cards being updated will in effect become non-operational during this process, so the system will want to seamlessly reroute the communication messages using the redundant parts so that the system does not have to shut down during an upgrade.

21. **Claims 5 and 14** are rejected under 35 U.S.C. 103(a) as being unpatentable over Cantwell et al (US 6,370,155), hereinafter Cantwell, in view of Barker et al (US 6, 363, 421), hereinafter referred to as Barker, as applied to claims 1 and 10 respectively, above, and further in view of Harris (US 5, 771, 274).

The combination of Cantwell and Barker teaches all aspects of the claimed invention as set forth in the rejections of claims 1 and 10 but does not expressly disclose storing all of the past faults and the maintenance record of each element in a database.

Harris discloses a method and apparatus for detecting traffic-affecting failures in a telecommunication network.

Harris discloses a method of recording data related to each element in a database; and updating the database to reflect changes to any of the elements, wherein the changes include maintenance performed on, replacement of, or user configuration changes. **(In Column 3, Lines 47-54 indicates fault alarms, status information, and performance statistics being collected and recorded in a database. Further he shows in Column 4, Lines 9-10 that maintenance record is maintained. In Column 4, Lines 11-21, Harris discloses adding new alarms to a database that includes data of past alarms that are cleared.)**

It would have been obvious to a person of ordinary skill in the art to keep a record of past problems as disclosed by Harris in the combination of Cantwell and Barker. One would have been motivated to do this because keeping a record of past faults and changes can indicate the overall reliability of a particular system and can indicate when and how often a replacement part or system may be needed.

22. **Claims 9 and 18** are rejected under 35 U.S.C. 103(a) as being unpatentable over Cantwell et al (US 6,370,155), hereinafter Cantwell, in view of Barker et al (US 6, 363, 421), hereinafter referred to as Barker, as applied to claims 1 and 10 respectively, above, and further in view of Badt, JR., (US Pub. No. 2003/0133417), hereinafter referred to as JR.

The combination of Cantwell and Barker teaches all aspects of the claimed invention as set forth in the rejections of claims 1 and 10 but does not expressly disclose the existence of a connection map.

JR. discloses a method of obtaining a topology of the available spare links in a telecommunication network provisioned with a distributed restoration algorithm.

JR. discloses that the flexible cross-connect system is a first node within a network **(Paragraph 172),** and further maintains a connection map for the network. **(Paragraph 174)**.

It would have been obvious to a person of ordinary skill in the art to use the teachings of JR. involving a method keeping a database that tracks the network spare capacity and connection map in the cross-connect units disclosed in both Cantwell's and Barker's systems. One would have been motivated to do so because this data can be stored in a central location at a database at the OSS or at the first node, so that it may be used efficiently for remotely managing network elements at a reduced cost and the data may be provided to the node originating failure notice as soon as failure is detected and reported.

23. **Claim 19**, as best understood, is rejected under 35 U.S.C. 103(a) as being unpatentable over Cantwell et al (US 6,370,155), hereinafter Cantwell, in view of Read et al (US 5, 781, 527), hereinafter referred to as Read, and Badt, JR., (US Pub. No. 2003/0133417), hereinafter referred to as JR.

Cantwell discloses a method for controlling the operation of a flexible cross-connect system **(Figure 1)** which has a plurality of elements including an active

control unit **(Figure 1, element 12, Column 3, Lines 26 and 40-45)**, a redundant control unit **(Figure 1, elements 12 A & B; Column 3, Lines 37-40)**, a plurality of interface cards **(Figure 1, elements 28 and 30; Column 6, Lines 5-10)**, an active cross-connect unit, a redundant cross-connect unit **(Figure 1, elements 24 and 26; Column 4, Lines 1-10)**, and a backplane forming a plurality of data buses **(Column 13, Lines 63-67; Column 16, Lines 33-38 and Column 18, Lines 40-45. In Figure 5 the Network Interface card is shown connected to the backplane as further illustrated in Column 13, Lines 63-67)**, the data buses acting as communications links between the plurality of elements **(See Column 10, Lines 42-45 with respect to Figure 4 and Column 11, Lines 5-10 with respect to Figure 3 and Column 15, Lines 35-37)**, that comprises:

monitoring the operational status for each one of the plurality of elements and each one of the communications links between the plurality of elements within the flexible cross-connect system; **(Cantwell teaches monitoring the operational status of the cards in terms of detecting fuse failures and fuse panel power failures as well as monitoring the operational status of links by monitoring analog and digital signal loss as illustrated in Column 15, Lines 30-35 and 55-60. Communication link monitoring is also provided as part of DS1 path and line performance monitoring. Column 12, Lines 41, 47, and 55; Column 13, Lines 7, Line 12, and 19; Column 15, Line 58; Column 17, Lines 45-48;)**

determining when the operational status of any of the plurality of elements or the communications links between the plurality of elements indicates that the element or the

communications link between the plurality of elements is non-operational; **(Column 12, Lines 41, 47 , and 55; Column 13, Lines 7, Line 12, and 19; Column 15, Line 58; Column 17, Lines 45-48; Column 7, Lines 38-42; Performance monitoring of network elements involves data collection as well as determining the operational status of network elements by comparing the observed test results to predetermined threshold values)**

autonomously switching from the non-operational active element to an associated redundant element when the operational status of the non-operational active element is determined or from the non-operational active communications link between the plurality of elements to an associated redundant communications link between the plurality of elements when the operational status of the non-operational active communications link between the plurality of elements is determined; **(Column 16, Lines 41-46;Column 17, Lines 45-48; Column 18, Lines 50-55. Cantwell's system allows autonomous switching at the network interface card level and at the system communication link level if the non-operational active card's or active link's performance monitoring indicated the need to switch to the redundant card or link respectively. Further Cantwell discloses autonomous switching can be made at the Administrative Subsystem level as well as at the network interface card level as illustrated in Column 7, Lines 60-67; Column 8, Lines 1-3; Column 17, Lines 40-48; and Column 19, Lines 32-42)**

determining when the non-operational active element or the non-operational active communications link between the plurality of elements requires maintenance; **(In**

Column 2, Lines 42-49; Column 6, Line 25-28; and Column 9, Lines 35-42, Cantwell teaches maintenance is done on a primary network interface card (i.e. an active element). An absolute necessary condition for maintenance to occur is the detection of failure condition. Cantwell defines error condition as LOS, LOF, etc... in Column 13, Lines 57-59. Further Cantwell teaches detection of failure condition in column 15, lines 55-60.).

Cantwell, however, does not expressly disclose reporting maintenance is required for non-operational elements or links between the plurality of elements.

Read discloses a digital cross-connect system.

Read discloses a system that reports maintenance is required for the non-operational active element or the non-operational active communications link between the plurality of elements when it is determined that the non-operational active element or the non-operational active communications link between the plurality of elements requires maintenance. **(Column 10, Lines 34-35, Lines 47-49, and Lines 57-60;)**

It would have been obvious to a person of ordinary skill in the art at the time of the invention to use the maintenance-reporting scheme of Read in Cantwell's invention when a card or a link fails. One would have been motivated to do this because having the failed component up and running again would ensure that the current connection has a backup connection for when it breaks down in the future guaranteeing continued path protection and end-to-end path integrity.

Cantwell fails to expressly disclose a system that maintains a connection map associated with the flexible cross-connect system, the flexible cross-connect system being a node in a network, the connection map being arranged to indicate statuses of nodes with the network„ wherein when it is determined that the operational status of any one of the plurality of elements or any one of the communications links between the plurality of elements indicates that the card is non-operational or the communications link between the plurality of cards is non-operational, the connection map is updated to indicate a change in status of the flexible cross-connect system.

JR. discloses a method of obtaining a topology of the available spare links in a telecommunication network provisioned with a distributed restoration algorithm.

JR. discloses a system that maintains a connection map associated with the flexible cross-connect system **(Paragraph 174)**, the flexible cross-connect system being a node in a network **(Paragraph 172)**, the connection map being arranged to indicate statuses of nodes with the network„ wherein when it is determined that the operational status of any one of the plurality of elements or any one of the communications links between the plurality of elements indicates that the element is non-operational or the communications link between the plurality of elements is non-operational, the connection map is updated to indicate a change in status of the flexible cross-connect system. **(Paragraphs 8, 179 and 185; JR.'s discloses a system with the capability to generate a connection map that shows the active nodes along with cards and links and when ever a link or a path or a card fails the map in the database is updated to reflect the correct status including change in spare capacity.)**

It would have been obvious to a person of ordinary skill in the art to use the teachings of JR. involving a method keeping a database that tracks the network spare capacity and connection map in the cross-connect units disclosed in both Cantwell's and Read's systems. One would have been motivated to do so because this data can be stored in a central location at a database at the OSS or at the first node, so that it may be used efficiently for remotely managing network elements at a reduced cost and the data may be provided to the node originating failure notice as soon as failure is detected and reported.

Response to Arguments

24. Applicant's arguments filed on 21 March 2006 have been fully considered but they are not persuasive.

25. The Applicant argues, in the Remarks on page 13, that the Examiner's objection to the drawings not showing a backplane forming a plurality of data buses, the data buses, and the communication links between the plurality of elements is inappropriate. The Applicant further indicates that Figure 7 shows a backplane and Figures 1-3 show features of backplane. Examiner respectfully disagrees with Applicant's conclusion.

The Applicant's response of 3/21/06 fails to show a figure with a backplane. The Applicant points to Figure 7 of the Application being examined as showing a backplane. The Applicant's Figure 7 does not show a backplane. Figure 7 only shows a cross-connect system as part of a network ring.

The Applicant's response of 3/21/06 fails to show a figure with a plurality of data buses. The only data bus shown in the Figures is element 360 in Figure 3, which is a

single data bus. Applicant in the Remarks on page 13 in line 9 only mentions element 360 in Figure 3 as a data bus. Further, Applicant correctly indicates in the Remarks, on page 13 in lines 8-9, that communication links are different from data buses. Therefore, the Examiner is maintaining the objection to the drawings.

26. The Applicant argues, in the Remarks on page 15, regarding the independent claims failing to comply with the enablement requirement, that providing support for how a link connected to a card interface is monitored is a detailed procedure and one skilled in the art would be able to determine how to monitor a link connected to a card interface. Examiner respectfully disagrees with Applicant's conclusion.

It is not clear how the failure condition of the cards alone or the links alone can be determined independently given the fact that the cards are connected to the links. Therefore, the Examiner is maintaining the 112 1st paragraph rejection with respect to the independent claims.

27. The Applicant argues, in the Remarks on page 17 in the last paragraph, that Cantwell fails to teach the specific limitation in claim 1 that states, "...determining when the non-operational active element or the non-operational active communications link between the plurality of elements requires maintenance...". Specifically Applicant argues, in the Remarks on page 18 in the 1st line, that there is no teaching of determining when maintenance is required. Applicant repeats the same argument, in the Remarks on page 23 in the first paragraph, for claim 19. Examiner respectfully disagrees with Applicant's conclusion.

First, since the specification does not provide a definition of the phrase "non-operational active element", the Examiner has taken the broadest interpretation of the phrase non-operational active element to simply mean an active element in an idle state without traffic. Also operational active element simply means an active element with traffic and is consequently in a busy state.

Applicant admits that Cantwell teaches that maintenance is performed on the primary (i.e. active) interface card and it is clear that the purpose of the spare card is to facilitate the maintenance on the primary interface card that will require maintenance and this point is further illustrated by Cantwell in Column 2, Lines 42-49; Column 6, Line 25-28; and Column 9, Lines 35-42. An absolute necessary condition for maintenance to occur is the detection of failure condition. Cantwell defines error condition as LOS (Loss of Signal), LOF (Loss of Frame), etc... in Column 13, Lines 57-59. Further Cantwell teaches detection of failure condition in column 15, lines 55-60. Therefore, Cantwell clearly and unambiguously teaches the limitation that states, "determining when the non-operational active element or the non-operational active communications link between the plurality of elements requires maintenance".

28. Applicant argues, in the Remarks on page 18 in the last paragraph, that Cantwell fails to teach the limitation in claim 1 that states, "...autonomously switching from the non-operational active element to an associated redundant element when the operational status of the non-operational active element is determined or from the non-operational active communications link between the plurality of elements to an associated redundant communications link between the plurality of elements..." The

same argument is repeated for independent claims 6 and 15 in the Remarks in Section 2 on page 20. Examiner respectfully disagrees with Applicant's conclusion.

Cantwell teaches autonomous switching at all levels. In particular, in Column 16, Lines 41-46;Column 17, Lines 45-48; Column 18, Lines 50-55, Cantwell's system allows autonomous switching at the network interface card level and at the system communication link level if the non-operational active card's or active link's performance monitoring indicated the need to switch to the redundant card or link respectively. Further Cantwell discloses autonomous switching can be made at the Administrative Subsystem level as well as at the network interface card level as illustrated in Column 7, Lines 60-67; Column 8, Lines 1-3; Column 17, Lines 40-48; and Column 19, Lines 32-42.

29. Applicant argues, in the Remarks on page 18 in the last paragraph in lines 2-5, that Cantwell teaches away from having an active and redundant cross-connect units as claimed in claim 1. Applicant indicates that Cantwell in Column 16, lines 39-42 teaches that data is accepted from both cross connect units or matrix planes. Examiner respectfully disagrees with Applicant's conclusion.

Cantwell teaches, in Figure 1 in element 16 and Column 3, Line 67 and Column 4, Lines 1-4, two active and redundant cross-connect units. Further, Cantwell's system has the unique advantage of monitoring the operational status of standby or redundant elements and Cantwell in Figure 2 and Column 7, Lines 30-42 and Column 15, 57-59, further illustrates this point. Finally, even the passage cited from Cantwell by the Applicant (i.e. 16:39-42) when taken into proper context does verify that Cantwell's

system has an active and redundant cross-connect units. The fact that both cross-connect units (i.e. matrix planes) send parity data simply verifies both the active and redundant units are monitored to continuously determine their operational status and yet in Cantwell Column 16, line 42 it shows despite the monitoring only one unit is selected as active.

30. Applicant argues, in the Remarks on page 19 in lines 3 to 9, in the last Office Action dated 12/28/2005, that Examiner erroneously indicated that the limitation that states "autonomously switching from a non-operational active *element* to an associated redundant *element* includes switching from an active control unit to a redundant control unit, as well as switching from a non-operational active cross connect unit to a redundant cross-connect unit" is not claimed. Examiner would like to point out for the record that this limitation in question now is fully claimed with the addition of new claims 23 and 24 as well as because all independent claims are now amended to replace the word "card" with the word "element".

31. Applicant argues, in the Remarks on page 19 in the last sentence of the last paragraph, by indicating Harris fails to teach the limitation in claim 5 that states, "... a method of recording data related to each element in a database; and updating the database to reflect changes to any of the elements, wherein the changes include maintenance performed on, replacement of, or user configuration changes." Applicant further argues that a database of all active fault alarms does not suggest recording data related to each element in a database and all elements like cross-connect units, cards and control units may not have a fault alarm and unless an element has a fault alarm

data associated with that element it would not be recorded in the database of Harris. Examiner respectfully disagrees with Applicant's conclusion.

Harris in Column 3, Lines 47-54 indicates fault alarms, status information, and performance statistics being collected and recorded in a database. This is further shown in Harris' Figure 1 in that the Fault Management System is collecting from the remote management system the collected data and storing it in an active alarm database. Further Harris shows in Column 4, Lines 9-10 that maintenance record is maintained. In Column 4, Lines 11-21, Harris discloses adding new alarms to a database that includes data of past alarms that are cleared. Further in Harris' Figure 2B it is clearly shown topological data is also obtained from the topology database in Harris' Figure 1, element 102 and placed in the active alarm database along with the active alarm or status information retrieved from the remote monitoring system monitoring the network elements. Given the fact that Harris' Fault Management System is able to receive fault alarms, status information, and performance statistics as illustrated in Column 3, lines 47-48 and store it in a database refutes all of the Applicant's arguments on this issue.

30. Applicant argues, in the Remarks on page 21 in the second paragraph, Barker fails to teach the limitation in claim 6 that states, "...detecting and reporting when any element or communication link between the plurality of elements has a change in operational status.". Applicant further argues that Barker does not indicate an operational status is an attribute. Applicant further argues that Barker's system solely relies on polling and auditing. Examiner respectfully disagrees with Applicant's conclusion.

Barker teaches in Column 13, Lines 48-54 an object oriented system where all monitored network elements are represented as managed objects with attributes. Barker further teaches in Column 13, Lines 55-60; Column 39, Lines 555-67; and Column 40, Lines 12-16 that the managed objects representing the monitored network elements have attributes that define the operations that are performed on the network element. Applicant's argument regarding operational status in Barker's system not being an attribute can easily be refuted by referring to Barker's Column 15, Lines 15-20 which unequivocally states, "... These attributes describe various maintenance, operational, configuration and measurement information about the managed object...." See also Barker's Column 15, Lines 55-60. Barker's system is shown in Figures 3 and 14 where the monitored network element maintains an operational status table that is polled and/or audited by the SNMP agent that resides on the monitored network element and any operational status change is reported back to the element management system server. In addition to the polling and auditing mechanisms used in Barker's system, the event handler is capable of sending operational status to the element management system server on a continuous basis via the SNMP agent. Barker in Column 4, Lines 43-47 and 53-62 and Column 5, Lines 65-67 and Column 6, Lines 1-3 and 25-30 further illustrates this point.

33. Applicant argues, in the Remarks on page 23 in the last four sentences of the last paragraph, that Badt fails to teach part of the limitation in claim 19 that requires a connection map that indicate statuses of nodes within a network and where a node is a

cross-connect and the map is updated to indicate a change of statuses of the cross-connect system. Examiner respectfully disagrees with Applicant's conclusion.

Applicant readily admits in the Remarks on page 23 in lines 18-19 that Badt teaches a static map of nodes, and a map of spare capacity that is updated. It is the position of the Examiner that a continuous updated map of spare capacity of nodes meets the claimed limitation in that such a map is also a connection map that indicates the statuses of nodes and is continuously updated to show the change of statuses of the nodes at least with respect to spare capacities. However, Badt fully teaches the limitation in question because in the OSS 326 in Figure 45, as clearly indicated in Paragraph 171, a map is maintained that contains all of the nodes for all the networks and the nodes are constantly monitored for a change in operational status. The monitoring of the operational status of the nodes by the OSS 326 is further detailed in Paragraphs 177 and 179. However, in Badt's system in addition to the connection map showing all nodes and their respective operational status, a second map is generated showing the spare capacity of the network as indicated in Paragraphs 179 and 185.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following US Patents disclose a device that sends an indication that it is receiving software update:

US Patent (6, 122, 639) to Babu et al

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Habte Mered whose telephone number is 571 272 6046. The examiner can normally be reached on Monday to Friday 9:30AM to 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hassan Kizou can be reached on 571 272 3088. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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